Space Weather Forecast

Issued on Sunday, 18 June 2023 at 13:09 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of Minor/Moderate R1/R2 radio blackouts throughout.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Moderate over the past 24hrs, with a short duration M-class flare originating from a sunspot region in the south-eastern quadrant.
There are currently ten sunspot groups on the visible disc, two of which are quite large and magnetically complex. These are in the southern/south-eastern part of the disc. All other regions appear generally stable.

A large prominence lifted off the sun during the evening UTC hours in the northwest quadrant, generating a couple of Coronal Mass Ejections (CME). The first one occurred around 17/1720UTC and is not considered to be Earth-directed. However the second one, which occurred around 17/2100UTC, clearly displays an Earth-directed component. It has been analysed and the results are still pending. However its velocity is not estimated to be fast, hence most likely to arrive at Earth on Day 4. Another CME was observed leaving the sun at 17/2350UTC, originating from a filament eruption in the centre south of the disc. This one has also been analysed and while the results are still pending, it is estimated to be much faster and may give a glancing blow at Earth on Day 2. Low confidence with timings until we obtain the results of the two analysis.

Solar Wind / Geomagnetic Activity: The solar wind was indicative of the waning influence from a fast solar wind stream. The solar wind speed saw a gradual declining trend from Slightly Elevated to Slow-Ambient levels. The associated magnetic field and the all important north-south component was weak throughout. The net result of the above solar wind measures was Quiet geomagnetic activity (Kp0-2) with a provisional Kp '3' in the 00-03UTC interval.

Energetic Particles / Solar Radiation: No solar radiation storms were observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar Activity is most likely to remain Low with some Moderate periods at times. With no significant regions leaving the disc in the coming four day, solar activity levels should remain unchanged. They may even increase given the bright flux regions observed in satellite imagery, indicating the potential for further regions to emerge from the far side.

Solar Wind / Geomagnetic Activity: Several CMEs were observed in coronagraph imagery. These have been analysed and although the results are not yet known, it is estimated that there is a chance of a glancing blow over the next few days. Geomagnetic activity is expected to be mostly Quiet with a slight chance of Unsettled intervals on Day 1 (18 June). However some magnetic storms are possible late on Day 2 (19 June - G3/ Strong Storm) and Day 3 (20 June - G2/Moderate Storm). Activity mostly Unsettled to Active on Day 4 (21 June). Very low

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confidence though.

Energetic Particles / Solar Radiation: No solar radiation storms are expected, though a very Slight Chance of enhancement throughout given the current configuration of front-sided sunspot groups.

Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	1	30	10	5
Strong	G3	No	1	10	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	60	60	60	60
Very Active	R3 to R5 X	No	5	5	5	5

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Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	**≥ S1**	No	5	5	5	5
Very Active	**≥ S3 ***	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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